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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/643,898	08/20/2003	Yong-Kwun Lee	1572.1144	4660

21171 7590 12/29/2005

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WASHINGTON, DC 20005

EXAMINER

MARC, MCDIEUNEL

ART UNIT	PAPER NUMBER
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3661

DATE MAILED: 12/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/643,898

Applicant(s)

LEE ET AL.

Examiner

McDieunel Marc

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 09 March 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) all is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. Claims 1-39 are pending for examination.
2. The rejection to claims 1-39 are under 35 U.S.C. 103(a) as being unpatentable over **Kuroki et al.** (U.S. Pat. No. 6,898,485) is **maintained**.

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).
5. Claims 1-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Kuroki et al.** (U.S. Pat. No. 6,898,485).

As per claims 1-39, Kuroki et al. teaches a legged robot having FIGS. 1 and 2 are respectively perspective front and rear views of a legged walking robot 100 according to an embodiment of the present invention. FIG. 3 is a schematic illustration of a multi-joints degrees-of-freedom configuration model that the legged walking robot 100 is provided with. As shown in FIG. 3, the legged walking robot 100 has upper limbs including two arms and a head 1, lower limbs including two legs for achieving a locomotive motion, and a trunk connecting the upper limbs and the lower limbs. A neck joint for supporting the head 1 has 3 degrees of freedom: i.e., a neck-joint yaw-axis 2, a neck-joint pitch-axis 3, and a neck-joint roll-axis 4. Each arm has a shoulder-joint pitch-axis 8, a shoulder-joint roll-axis 9, an upper-arm yaw-axis 10, an elbow-joint pitch-axis 11, a forearm yaw-axis 12, a wrist-joint pitch-axis 13, a wrist-joint roll-axis 14, and a hand 15. In reality, the hand 15 has a multi-joints multi-degrees-of-freedom structure including a plurality of fingers. However, it is assumed in this specification that the hand 15 has zero degree of freedom since motions of the hands 15 have little affect on the attitude control and the walking control of the legged walking robot 100. That is to say, each arm has 7 degrees of freedom. The trunk has 3 degrees of freedom: i.e., a trunk pitch-axis 5, a trunk roll-axis 6, and a trunk yaw-axis 7. Each leg constituting the lower limbs has a hip-joint yaw-axis 16, a hip-joint pitch-axis 17, a hip-joint roll-axis 18, a knee-joint pitch-axis 19, an ankle-joint pitch-axis 20, an ankle-joint roll-axis 21, and a foot 22. In this specification, the cross point between the hip-joint pitch-axis 17 and the hip-joint roll-axis 18 defines a hip-point location of the legged walking robot 100 according to the embodiment. Although the human foot 22 actually has a structure including a bottom having multi-joints multi-degrees-of-freedom, it is assumed that the foot

bottom of the legged walking robot 100 according to the embodiment has zero degree of freedom. That is to say, each leg has 6 degrees of freedom (see figs. 1-3) which equates a motion controller for a robot that comprises at least upper limbs, a trunk, and lower limbs and that performs a legged locomotion with the lower limbs, the controller comprising: means for setting motions of at least one of the upper limbs, the trunk, and the lower limbs; means for calculating a pitch-axis moment and/or a roll-axis moment of the body of the legged walking robot, these moments being generated at a preset ZMP by the set motions of the upper limbs, the trunk, and the lower limbs; means for calculating motions of the lower limbs and the trunk for canceling the pitch-axis moment and/or the roll-axis moment; means for calculating a yaw-axis moment of the body of the legged walking robot, the moment being generated at the preset ZMP by the calculated motions of the lower limbs and the trunk; means for calculating a motion of the upper limbs for canceling the yaw-axis moment; and means for modifying the set motions of the upper limbs, the trunk, and the lower limbs in accordance with the calculated motions of the upper limbs, the trunk, and the lower limbs (see Kuroki's et al. figs. 1-3 and cols. 11-12). Kuroki et al. does not explicitly mentioned calf member and femoral member.

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the robot type of Kuroki et al. by introducing figs. 1-2 which implicitly contains calf and femoral member, thereby improving the actuation, the efficiency and the stability of the two-legged walking robot.

*Response to Arguments*

6. As to the reference not teaching “a calf member or double axis ankle joint” (see figs. 1-2, particularly the trapezoid member is a calf member or double axis ankle joint), note that each leg has a double axis.

7. Applicant's arguments filed 9/21/2005 have been fully considered but they are not persuasive.

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

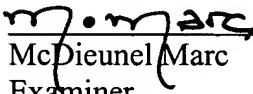
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9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to McDieunel Marc whose telephone number is (571) 272-6964.

The examiner can normally be reached on 6:30-5:00 Mon-Thu.

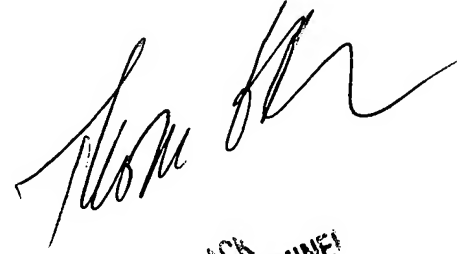
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Black can be reached on (571) 272-6956. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
McDieunel Marc  
Examiner  
Art Unit 3661

Friday, December 16, 2005

MM/

  
THOMAS G. BLACK  
SUPERVISORY PATENT EXAMINER  
GROUP 3600